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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
| 08/825,808 | 04/03/97 | BERNSTEIN | MIT-7581L |

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MM11/0603

EXAMINER

HACK, J

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 06/03/99

Disposition of Claim

A. Claim 20

Claim 20

Please find below and/or attached an Office communication concerning this application or proceeding.

X Claim 20 is amended to read:

Claims

Commissioner of Patents and Trademarks

Applicant's Remarks

See the attached Remarks in response to Patent Office action dated 11/14/98.

The drawing submitted on 11/14/98 is objected to by the Examiner.

The proposed drawing is not acceptable to the Examiner.

The specification is not acceptable to the Examiner.

The oath or declaration is not acceptable to the Examiner.

Priority under 35 U.S.C. § 119

Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a) in the following foreign application(s) of the applicant or of the inventor of the invention of the priority documents listed below:

received

received in Application No. (Serial Code/Serial Number)

received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

Claimed priority not received.

Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

X Notice of Reference Cited, PTO-89

X Information Disclosure Statement(s), PTO 1449, Paper No(s).

Interview Summary, PTO 113

Notice of Draftsman's Patent Drawing Fee, PTO 842

Notice of Informal Patent Application, PTO 162

SEE OFFICE ACTION ON THE FOLLOWING PAGE

Office Action Summary

Application No.

08/825,808

Applicant(s)

Bernstein et al

Examiner

Jonathan Hack

Group Art Unit

2812



☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 20-41 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 20-24, 32, 33, and 36-38 is/are rejected.

☒ Claim(s) 25-31, 34, 35, and 39-41 is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2,7

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

2. Claims 20-24, 32-33 and 36-38 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al US Patent 5,608,257.

Lee et al discloses the invention of claim 20 as follows:

directing a laser upon an electrically-conductive cut-link pad (see Figure 2B items 12 and 24) conductively bonded between a first electrically-conductive line (see Figure 2B item 10) and a second electrically conductive line (see Figure 2B item 10) on a substrate, the cut-link pad having substantially less thermal resistance per unit length than each of the first and second lines (see column 4, lines 20-25 and lines 58-59);

maintaining the laser upon the cut-link pad until the laser infuses sufficient energy into the cut-link pad to break the conductive link across the cut-link pad between the pair of electrically-conductive lines (see column 1, lines 7-10 and column 3, lines 35-49).

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The structure of the fuse disclosed by Lee et al is not identical to that disclosed in the specification of the instant invention. However, claim 1 as worded reads on Lee et al because the invention of Lee et al is directed towards a fuse absorbing a greater amount of the laser energy than the surrounding elements, similar to claim 1 as worded.

For claims 21 and 36,

wherein the electrically-conductive cut-link pad lies in the same plane as the first and second electrically-conductive lines (see column 3, lines 61-62).

For claims 22 and 37,

wherein the electrically-conductive cut-link pad has an inner surface facing the substrate and an opposing outer surface facing away from the substrate, the first and second electrically-conductive lines extending from the inner surface into the substrate (see column 5, lines 34-36 and Figure 2B).

For claims 23 and 38,

wherein the laser beam extends across the entirety of the cut-link pad when the laser is directed upon the cut-link pad (see column 3, lines 50-55).

For claim 24,

wherein the electrically-conductive cut-link pad has an inner surface facing the substrate, the first electrically-conductive line extending from the inner surface into the substrate, the second electrically-conductive line lying in the same plane as the cut-link pad (see column 5, lines 34-36 and Figure 2B).

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For claim 32,

wherein the substrate includes a silicon oxide (see column 3, lines 35-40).

For claim 33,

a passivating layer covering the cut-link pad (see column 3, lines 1-3).

Allowable Subject Matter

3. Claims 25-31, 34-35 and 39-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The following is a statement of reasons for the indication of allowable subject matter: the prior art either singly or in combination fails to anticipate or render obvious the limitations of claims 25-30 and 30-40, that the width of the cut-link pad is at least a predetermined percentage greater than the width of each of the first and second electrically-conductive lines. It is assumed by the examiner that the cut-link pad in the instant invention is a simple, continuous shape having no projections extending away therefrom. The reason for this assumption is that the specification and the Figures of the instant invention discuss or show a simple design. Lee et al, however, discusses the use of "fins" and while these "fins" are not wider than the conductive lines, they absorb more of the incident laser energy similar to the instant invention. The instant invention, however, is understood to be easier to manufacture, as the shape of the cut-link pad is of a simple

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design. By incorporating the shape of the cut-link pad into claim 21, the independent claim 21 may be allowable for the reason just stated.

For claims 31 and 41, while there is prior art which discloses the use of a cut-link pad having greater thermal conductivity than the conductive lines, the references are distinguishable. Specifically, Sur, Jr. et al US Patent 5,882,998 teaches the use of a thin silicide layer in the fuse region, but here the fuse is cut by an electrical current, which is different than the instant invention which uses a laser. Another example can be seen in Shiozaki et al US Patent 4,682,204 which teaches that the fuse has an increased heat capacity (see column 3, lines 47-49). However, the structure used in Shiozaki et al is a composite, made up of an oxide with grooves and a polysilicon layer disposed inside of the grooves to alter the heat capacity. This differs from the instant invention in that the instant invention discusses the use of a single, continuous material.

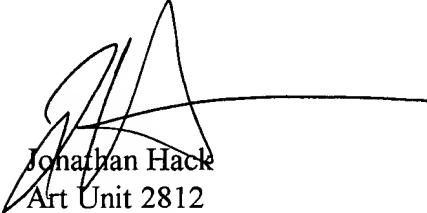
For claims 34 and 35, the prior art discusses the use of a silicon nitride layer disposed upon the link, but there is a portion of the silicon nitride layer which is removed to allow for laser cutting (see Coffey et al US Patent 5,070,392 column 6, lines 23-29). The technique of Coffey et al is different from the instant invention in that in the instant invention, the silicon nitride layer is maintained over the cut-link. In fact, the silicon nitride layer is integral to the purpose of the invention in that it allows for cracks to advantageously be formed due to the hardness of the silicon nitride layer in comparison to the cut-link and the substrate.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Hack whose telephone number is (703) 308-1341. The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached on (703) 308-3325. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.



Jonathan Hack
Art Unit 2812
June 1, 1999

John F. Niebling
Supervisory Patent Examiner
Technology Center 2800